

AMENDMENTS TO THE CLAIMS

Please amend the claims by adding new Claims 48-65. All of the currently-pending claims are set out below.

1. Cancelled
2. (Previously Presented) An illumination module, comprising:
 - a dielectric layer having first and second sides;
 - a plurality of light emitting diodes (LEDs);
 - a plurality of electrically-conductive contacts on the first side of the dielectric layer, each of the plurality of contacts being configured to mount an LED such that the plurality of LEDs are electrically connected;
 - a heat conductive body on the second side of the dielectric layer;
 - a heat conductive surface in communication with the heat conductive body, the heat conductive surface having a surface area substantially greater than a surface area of the heat conductive body;
 - wherein heat from the LEDs is communicated through the contacts, dielectric layer, and heat conductive body to the heat conductive surface.
3. (Previously Presented) The illumination module of Claim 2, comprising a heat conductive tab, and the tab comprises the heat conductive surface.
4. (Previously Presented) The illumination module of Claim 3, wherein the heat conductive tab behaves as a heat sink.
5. (Previously Presented) The illumination module of Claim 2, wherein heat is dissipated from the heat conductive surface to the surrounding environment.
6. (Previously Presented) The illumination module of Claim 2, wherein the heat conductive body is generally flat.
7. (Previously Presented) The illumination module of Claim 6, wherein the contacts are substantially flat and coplanar relative to each other.
8. (Previously Presented) The illumination module of Claim 7, wherein the body is substantially parallel to the contacts.
9. (Previously Presented) The illumination module of Claim 8, wherein the heat conductive surface is substantially complementary to a surface of the heat conductive body.

10. (Previously Presented) The illumination module of Claim 9, comprising a heat conductive tab, and the tab comprises the heat conductive surface.

11. (Previously Presented) The illumination module of Claim 10, wherein the heat conducting tab behaves as a heat sink.

12. (Previously Presented) The illumination module of Claim 9, wherein the heat conductive surface has a thermal conductivity greater than about 100 W/mK.

13. (Previously Presented) The illumination module of Claim 12, wherein the heat conductive surface comprises a metal.

14. (Previously Presented) The illumination module of Claim 13, wherein the heat conductive surface comprises aluminum.

15. (Previously Presented) The illumination module of Claim 12, wherein the body has a thermal conductivity greater than about 100 W/mK.

16. (Previously Presented) The illumination module of Claim 12, wherein the heat conductive surface is substantially rigid.

17. (Previously Presented) The illumination module of Claim 9, wherein the dielectric member is substantially planar.

18. (Previously Presented) The illumination module of Claim 9, wherein the heat conductive surface is significantly larger than a surface of the heat conductive body.

19. (Previously Presented) The illumination module of Claim 2, wherein each of the LEDs comprises a lead, and the leads are configured to be mounted to respective contacts.

20. (Previously Presented) A method of making an illuminated display, comprising:
providing a housing having at least one wall surface;
providing a plurality of the illumination modules of Claim 2; and
mounting the plurality of illumination modules onto the at least one wall surface.

21. (Previously Presented) The method of Claim 20, wherein the illumination modules comprise a heat conductive tab, and the tab comprises the heat conductive surface.

22. (Previously Presented) The method of Claim 21 additionally comprising mounting an illumination module so that at least a portion of the heat conductive tab is not in contact with the housing wall surface.

23. (Previously Presented) An illumination apparatus, comprising

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a housing;
a heat conductive surface arranged in an interior of the housing; and
an illumination module mounted on the heat conductive surface, the illumination module comprising:

 a dielectric having a first side and a second side;
 at least two light emitting diodes (LEDs);
 a plurality of electrically conductive contacts on the first side of the dielectric, each of the plurality of contacts being configured to mount a lead of an LED such that the LEDs are electrically connected; and

 a heat conductive body on the second side of the dielectric;
wherein heat from the LEDs flows through the contacts and dielectric to the heat conductive body, and from the body to the heat conductive surface.

24. (Previously Presented) The apparatus of Claim 23, wherein the heat conductive surface is significantly larger than a surface of the heat conductive body.

25. (Previously Presented) The apparatus of Claim 23, wherein the heat conductive body contacts the heat conductive surface.

26. (Previously Presented) The apparatus of Claim 23, wherein the housing comprises a wall surface, and the heat conductive surface is attached to the wall surface.

27. (Previously Presented) The apparatus of Claim 23, wherein the heat conductive body is substantially flat.

28. (Previously Presented) The apparatus of Claim 27, comprising a heat conductive tab comprising the heat conductive surface.

29. (Previously Presented) The apparatus of Claim 28, wherein the heat conductive tab is larger than the heat conductive body.

30. (Previously Presented) The apparatus of Claim 29, wherein the heat conductive surface is substantially flat.

31. (Previously Presented) The apparatus of Claim 29, wherein the heat conductive tab comprises a material having a thermal conductivity greater than about 100 W/mK.

32. (Previously Presented) The apparatus of Claim 28, wherein the housing comprises a wall surface, and at least a portion of the heat conductive surface is spaced from the wall surface.

33. (Previously Presented) The apparatus of Claim 32, wherein the heat conductive surface is configured to draw LED-generated heat from the module for dissipation in the housing.

34. (Previously Presented) The apparatus of Claim 23, wherein the housing comprises a plurality of wall surfaces that define a channel.

35. (Previously Presented) The apparatus of Claim 34, wherein a translucent cover extends over the channel.

36. (Previously Presented) The apparatus of Claim 35, wherein heat from the LEDs is drawn to the heat conductive surface and dissipated from the surface into the channel.

37. (Previously Presented) The apparatus of Claim 23, wherein the housing comprises a wall surface, and the wall surface comprises the heat conductive surface.

38. (Previously Presented) The apparatus of Claim 37, wherein the wall surface comprises metal.

39. (Previously Presented) An illumination module for mounting on a heat conducting surface that is larger than the module, the module comprising:

- a heat conductive body having a first side and a second side;
- a thin dielectric portion on a first side of the heat conductive body;
- a plurality of light emitting diodes (LEDs); and

- a plurality of electrically-conductive contacts on a first side of the dielectric portion, the LEDs being mounted to the contacts such that the LEDs are electrically connected to one another, the contacts thermally communicating with the dielectric portion through a thermal communication area between the contacts and the first side of the dielectric portion;

wherein a second side of the dielectric portion is arranged on the first side of the heat conductive body so that the first side of the body is in thermal communication with the contacts through the dielectric portion; and

wherein the first side of the body has a surface area larger than the thermal communication area, and the second side of the body has a surface generally

complementary to the heat conducting surface to provide thermally conductive contact with the heat conducting surface;

whereby heat is thermally conducted from the LEDs to the heat conducting surface.

40. (Previously Presented) The illumination module of Claim 39, wherein the second side of the body has a generally flat surface.

41. (Previously Presented) The illumination module of Claim 40, wherein the contacts are substantially flat and coplanar relative to each other.

42. (Previously Presented) The illumination module of Claim 41, wherein a first side of the body is substantially flat and parallel to the contacts.

43. (Previously Presented) The illumination module of Claim 42, wherein the dielectric portion is substantially flat.

44. (Previously Presented) The illumination module of Claim 39, wherein the heat conductive body has a thermal conductivity greater than about 100 W/mK.

45. (Previously Presented) The illumination module of Claim 39, wherein the heat conductive surface has a thermal conductivity greater than about 100 W/mK.

46. (Previously Presented) The illumination module of Claim 39, comprising a heat conductive tab that comprises the heat conductive surface.

47. (Previously Presented) The illumination module of Claim 46, wherein the heat conductive tab is larger than the heat conductive body.

Please add the following new claims:

48. (New) An illumination device, comprising:

a light emitting diode (LED) module in combination with a heat sink member, the LED module attached to the heat sink member, the LED module comprising:

at least one LED;

a dielectric layer having first and second sides;

plural electrically-conductive contacts on the first side of the dielectric layer, the contacts being configured to mount the at least one LED such that the at least one LED is electrically connected to the contacts; and

a heat conductive body on the second side of the dielectric layer, the body being in thermal communication with the plural contacts through the dielectric layer;

wherein the heat conductive body is attached to the heat sink member so that heat flows from the body to the heat sink member; and

wherein the heat sink member has a surface area greater than a surface area of the heat conductive body.

49. (New) An illumination device as in Claim 48, wherein the heat sink member has a mount portion configured to accept the LED module, and the LED module is attached to the mount portion.

50. (New) An illumination device as in Claim 49, wherein the mount portion is integrally formed with the heat sink member.

51. (New) An illumination device as in Claim 50, wherein the mount portion is disposed at an angle relative to an adjacent portion of the heat sink member.

52. (New) An illumination device as in Claim 49, wherein the LED module is fastened to the mount portion using rivets.

53. (New) An illumination device as in Claim 49, wherein the LED module is fastened to the mount portion by an adhesive.

54. (New) An illumination device as in Claim 53, wherein the adhesive comprises a heat conductive adhesive.

55. (New) An illumination device as in Claim 53, wherein the heat conductive body comprises a flat aluminum plate.

56. (New) An illumination device as in Claim 55, wherein the heat conductive body is about 1 1/2 inches long.

57. (New) An illumination device as in Claim 56, wherein the heat sink and the heat conductive body each have a thermal conductivity greater than about 100 W/m*K.

58. (New) An illumination device as in Claim 49 additionally comprising means for mounting the device to a surface.

59. (New) An illuminated display apparatus, comprising:

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a plurality of the illumination devices recited in Claim 48 electrically connected to one another in an electrically parallel arrangement; and

a display member having a wall surface;

wherein at least one of the plurality of illumination devices is arranged on the wall surface.

60. (New) An illuminated display apparatus as in Claim 59, wherein the display member comprises a channel defined by a plurality of walls, and the illumination devices are disposed within the channel.

61. (New) An illuminated display apparatus as in Claim 60, wherein the wall surface is configured to function as a heat sink.

62. (New) An illumination apparatus, comprising:

an illumination device as recited in Claim 48; and

a housing, the housing having an outlet aperture and being attached to the heat sink member so as to generally enclose the LED module;

wherein the apparatus is adapted so that light from the LED module is directed out of the housing aperture.

63. (New) An illumination apparatus as in Claim 62 additionally comprising an optical element for directing light from the LED module in a desired direction.

64. (New) An illumination apparatus as in Claim 63, comprising a lens.

65. (New) An illumination apparatus as in Claim 63, comprising at least one reflector.